

Remarks

Reconsideration and allowance of this application, as amended, are respectfully requested. The Abstract of the Disclosure and claims 1-9 and 11-13 have been amended. Claims 10 and 14 have been canceled. Claims 1-9 and 11-13 are now pending in the application. The rejections are respectfully submitted to be obviated in view of the amendments and remarks presented herein. No new matter has been introduced through the foregoing amendments. Entry is in order.

As required by the Office Action, the Abstract of the Disclosure has been editorially revised for compliance with 37 CFR § 1.72. (The revised Abstract contains 150 words.)

In response to the rejection under 35 U.S.C. § 112, second paragraph, claims 1 and 12 have been editorially amended to even more distinctly claim the subject matter of the invention. Withdrawal of the rejection under § 112, second paragraph, is respectfully requested.

Claims 1-9 and 11-13 have also been further editorially amended for enhanced readability.

Claims 1 and 12 have been amended to further define the scope of the claimed invention. More specifically, amended claim 1 incorporates the recitation of now-canceled claim 10. Amended claim 12 incorporates the recitation of now-canceled claims 10 and 14.

Entry of each of the amendments is respectfully requested.

35 U.S.C. § 102(e) - Sampson

Claims 1, 2, and 4 stand rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent Application Publication No. US 2003/0022150 A1 of Sampson et al. (hereinafter "Sampson").

The rejection under § 102(e) is respectfully traversed. For at least the following reasons, the disclosure of Sampson does not anticipate Applicants' claimed invention.

As indicated above, claim 1 has been amended to define in pertinent part a device for electrochemical detection with a

potentiostat (P) having a third operational amplifier (OP3), to whose output the counterelectrode (GE) is connected and whose inverting input (OP3-) is connected via a second resistor (R2) to an output of a second operational amplifier (OP2) and is connected via a third resistor (R3) to a device for generating a selectable desired voltage, with a noninverting input (OP3+) of the third operational amplifier (OP3) being grounded.

In the claimed device, all of the working electrodes are held at the same potential at the same time (i.e., "a current/voltage converter (S1, S2, S3) being connected downstream of each of the working electrodes (AE1, AE2, AE3), the current/voltage converters (S1, S2, S3) holding all of the working electrodes (AE1, AE2, AE3) at the same potential").

In contrast, in Sampson's device, the working electrodes are "selectively addressed" (see, e.g., claim 1, paragraph (b)). For selectively addressing the working electrodes, Sampson's device requires the use of a complicated circuit. According to Sampson's paragraph [0022], the device requires digital analog converters for setting different voltages at the working electrodes.

According to Applicants' claimed invention, however, the device (as well as the method of measurement) is simplified significantly.

Sampson does not, therefore, describe a device that includes Applicants' claimed potentiostat and "current/voltage converter

(S1, S2, S3) being connected downstream of each of the working electrodes (AE1, AE2, AE3), the current/voltage converters (S1, S2, S3) holding all of the working electrodes (AE1, AE2, AE3) at the same potential."

Since Sampson does not describe each limitation of the claimed invention, Sampson does not anticipate the invention defined by Applicants' claim 1.

Dependent claims 2 and 4, each of which depends from claim 1, are allowable along with claim 1, and on their own merits.

For at least the above reasons, reconsideration and withdrawal of the rejection of claims 1, 2, and 4 under § 102(e) are respectfully requested.

35 U.S.C. § 102(e) - Hashimoto

Claims 1-10 and 12-14 stand rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,818,109 B2 to Hashimoto et al. ("Hashimoto"). The Office Action states in pertinent part that "[a]ddressing claim 10, . . . see Figure 15 and note counter electrode 1602, third operational amplifier 1607, second resistor R_f ."

The rejection under § 102(e) is respectfully traversed. For at least the following reasons, the disclosure of Hashimoto does not anticipate Applicants' claimed invention.

There is, *inter alia*, a structural difference between the circuit employed in Hashimoto's sensor and the circuit associated with Applicants' claimed device. See, for example, Hashimoto's Fig. 15, which depicts "an example of the circuit applied to the second nucleic acid detection chip according to the embodiment of the present invention" (Hashimoto, col. 3, lines 20-22).

The difference is the feature originally defined in claim 10, and now included in claim 1, i.e., that the "third operational amplifier (OP3) . . . is connected via a third resistor (R3) to a device for generating a selectable desired voltage." Hashimoto's circuit has a connection of the third operational amplifier (see element 1607 in Hashimoto's Fig. 15) via a capacitor to the first operational amplifier (see element 1609 in Fig. 15) which is connected to the working electrode (see right side of Fig. 15, i.e., the connection between "Signal" and the voltage source).

The circuit disclosed in Hashimoto's Fig. 15 has several disadvantages. For detecting the current via the working electrode, the drop in voltage across the resistor R_f is measured. As the drop in voltage is dependent on the current flowing through the respective working electrode, it follows that the working electrode cannot be at the potential during the measurement.

In contrast, according to Applicants' claimed invention, all of the working electrodes are connected to virtual ground, and are therefore held at the same potential. This significantly simplifies the measurement.

Even if one were to assume that the resistance across R_f shown in Hashimoto's Fig. 15 is very small, and that the working electrodes could be considered to be at approximately the same potential, then it would be necessary to provide an extremely precise differential amplifier for the measurement of the current. Such a measurement will be susceptible to error from noise. This disadvantage is avoided by virtue of using Applicants' claimed device.

Hashimoto does not, therefore, describe Applicants' claimed device which provides for, *inter alia*, "holding all of the working electrodes (AE1, AE2, AE3) at the same potential."

Since Hashimoto does not describe each limitation of the claimed invention, Hashimoto does not anticipate the invention defined by Applicants' claim 1.

Dependent claims 2-9, each of which depends either directly or indirectly from claim 1, are allowable along with claim 1.

Method claims 12 and 13 are similarly allowable. As indicated above, independent claim 12 has been amended to define in pertinent part a method for electrochemical detection that includes

c) simultaneously applying a predetermined voltage profile which is variable during the measurement between the working electrodes (AE1, AE2, AE3) and the reference electrode (RE),

while regulating said voltage between the working electrodes (AE1, AE2, AE3) and the reference electrode (RE) with a potentiostat (P) having a third operational amplifier (OP3), to whose output the counterelectrode (GE) is connected and whose inverting input (OP3-) is connected via a second resistor (R2) to an output of a second operational amplifier (OP2) and is connected via a third resistor (R3) to a device for generating a selectable desired voltage, with a noninverting input (OP3+) of the third operational amplifier (OP3) being grounded.

For reasons analogous to those presented above with respect to the allowability of Applicants' apparatus claims 1-9, the disclosure of Hashimoto does not anticipate the method defined by Applicants' claims 12 and 13.

Hashimoto fails to disclose Applicants' claimed method of detection that includes "c) simultaneously applying a predetermined voltage profile which is variable during the measurement between the working electrodes (AE1, AE2, AE3) and the reference electrode

(RE), while regulating said voltage between the working electrodes (AE1, AE2, AE3) and the reference electrode (RE) with a potentiostat (P)," and "d) measuring the currents flowing through the working electrodes (AE1, AE2, AE3), all of the working electrodes (AE1, AE2, AE3) being held at the same potential during the measurement."

For at least the above reasons, reconsideration and withdrawal of the rejection of claims 1-10 and 12-14 under § 102(e) are respectfully requested.

35 U.S.C. § 103(a) - Hashimoto in view of Blades and Ho

Claim 11 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Hashimoto in view of U.S. Patent No. 5,260,663 to Blades and U.S. Patent No. 4,488,556 to Ho. The Office Action relies upon Blades and Ho since "Hashimoto does not mention providing a capacitance in between the output of the third operational amplifier and the inverting input" (Office Action page 11).

The rejection of claim 11 under § 103(a) is respectfully traversed.

First, there is no suggestion or motivation in any of Hashimoto or Blades or Ho that would have led one to select the references and combine them in a way that would produce the invention defined by claim 11. Blades and Ho may disclose the use of a capacitance, but there is no suggestion in any of the references that would have led one to combine their teachings with the other references so as to arrive at Applicants' claimed device.

Furthermore, for all of the reasons indicated above with respect to the rejection under § 102(e), Hashimoto differs

structurally from Applicants' claimed device. Claim 1, therefore, from which claim 11 depends, is allowable.

And, even if the references were combined as asserted in the Office Action, they would not result in Applicants' claimed invention. Hashimoto is different from Applicants' claimed device. Blades and Ho may disclose the use of a capacitance, but add nothing that would rectify the above-described structural deficiency of Hashimoto.

Thus, the asserted combination fails to suggest Applicants' claimed device in which "a capacitance is connected between the output of the third operational amplifier (OP3) and the inverting input (OP3-) thereof."

For at least the above reasons, reconsideration and withdrawal of the rejection of claim 11 under § 103(a) are respectfully requested.

35 U.S.C. § 103(a) - Sampson

Claims 12-14 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Sampson. The Office Action acknowledges that "Sampson does not mention having all of the working electrodes being held at the same potential during the measurement."

The rejection of claims 12-14 under § 103(a) is respectfully traversed.

For reasons analogous to those presented above with respect to the allowability of Applicants' apparatus claims 1, 2, and 4, the disclosure of Sampson would not have rendered obvious the method defined by Applicants' claims 12 and 13.

Applicants' claim 12 defines a method that includes "d) measuring the currents flowing through the working electrodes (AE1,

AE2, AE3), all of the working electrodes (AE1, AE2, AE3) being held at the same potential during the measurement."

In the paragraph bridging Office Action pages 12 and 13, the examiner concludes that even though "Sampson does not mention having all of the working electrodes being held at the same potential during the measurement, this is clearly within the scope of Sampson." The Office Action goes on to hypothesize that "[f]or example, if all of the working electrodes have the same complementary biomolecule probes then all of the working electrodes may have the same voltage applied to them to get an average measurement for improved accuracy."

None of that which the examiner hypothesizes, however, is either taught, or even suggested, by Sampson. There is no suggestion whatsoever in Sampson of that which is asserted in the Office Action.

Therefore, the claimed invention would not have been obvious because there is no suggestion or motivation in Sampson that would have led one to modify the reference in a way that would produce the invention defined by either of claims 12 or 13.

For at least the above reasons, reconsideration and withdrawal of the rejection of claims 12-14 under § 103(a) are respectfully requested.

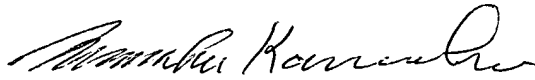
In view of the above, each of the presently pending claims in this application is believed to be in immediate condition for allowance. Accordingly, the examiner is respectfully requested to withdraw the outstanding rejections of the claims and pass this application to issue.

To the extent necessary, a petition for an extension of time under 37 CFR § 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including

extension of time fees, to Deposit Account 11-0219, and please credit any excess fees to such deposit account.

Respectfully submitted,

HAUPTMAN KANESAKA BERNER Patent Agents, LLP



Manabu Kanesaka

Registration No. 31,467

Customer Number: 32628
1700 Diagonal Road, Suite 310
Alexandria, Virginia 22314
(703) 519-9785 MAN/yok
Facsimile: (703) 519-7769

Date: October 25, 2005